

What is claimed is:

1. An oxygen concentration detector comprising:
a sensor element including a solid electrolyte
and external and internal electrodes provided on external
and internal surfaces thereof, respectively;

a heater provided adjacent to said internal sur-
face of said sensor element; and

a high-emissivity layer formed by a material
having a high emissivity is provided on at least one of said
internal surface of said sensor element and the surface of
said heater;

wherein said high-emissivity layer provided on
said internal surface of said sensor element has an emis-
sivity of 0.3 or more, and said high-emissivity layer pro-
vided on said surface of said heater is 0.6 or more.

2. An oxygen concentration detector according to
claim 1, wherein said high-emissivity layer provided on said
internal surface of said sensor element consists of one or
more materials selected from a group consisting of alumina,
titanium oxide, zirconium oxide, iron (III) oxide, nickel
oxide, manganese oxide, copper oxide, cobalt oxide, chromium
oxide, yttrium oxide, cordierite, silicon nitride, aluminum
nitride, and silicon carbide.

3. An oxygen concentration detector according to

claim 1, wherein said high-emissivity layer provided on said surface of said heater consists of one or more materials selected from a group consisting of iron (III) oxide, nickel oxide, manganese oxide, copper oxide, cobalt oxide, chromium oxide, silicon nitride, aluminum nitride, and silicon carbide.

4. An oxygen concentration detector according to claim 1, wherein a surface roughness of said high-emissivity layer is 1 μm or more.

5. An oxygen concentration detector according to claim 1, wherein said heater has a polygonal cross-section.

6. An oxygen concentration detector comprising:
a sensor element including a solid electrolyte and an external electrodes provided on an external surface thereof;

a heater provided adjacent to an internal surface of said sensor element; and

an electrode containing a material having a high emissivity is provided on said internal surface of said sensor element;

wherein said electrode provided on said internal surface of said sensor element has an emissivity of 0.3 or more.

Sub A2

7. An oxygen concentration detector according to claim 6, wherein said material having a high emissivity contained in said electrode provided on said internal surface of said sensor element consists of one or more materials selected from a group consisting of alumina, titanium oxide, zirconium oxide, iron (III) oxide, nickel oxide, manganese oxide, copper oxide, cobalt oxide, chromium oxide, yttrium oxide, cordierite, silicon nitride, aluminum nitride, and silicon carbide.

8. An oxygen concentration detector according to claim 6, wherein said surface roughness of said high-emissivity layer is 1 μm or more.

9. An oxygen concentration detector comprising:
a sensor element including a solid electrolyte and external and internal electrodes provided on external and internal surfaces thereof, respectively;

a heater provided adjacent to said internal surface of said sensor element;

wherein said heater consists of one or more materials selected from a group consisting of silicon nitride, ~~aluminum nitride, and silicon nitride.~~

10. An oxygen concentration detector according to claim 9, wherein said heater has a polygonal cross-section.

11. ~~An oxygen concentration detector~~
according to claim 9, wherein said material having high
emissivity has an emissivity of 0.6 or more.

12. An oxygen concentration detector
comprising:

a sensor element including a solid electrolyte
and external and internal electrodes provided on external
and internal surfaces thereof, respectively;

a heater provided adjacent to said internal sur-
face of said sensor element;

wherein said internal electrode consists of a
material having a high emissivity, and said external elec-
trode consists of a material having an emissivity lower than
the emissivity of said internal electrode.

13. An oxygen concentration detector
according to claim 12, wherein said internal electrode
consists of platinum black and ruthenium oxide.

14. An oxygen concentration detector
according to claim 12, wherein said surface of said internal
electrode facing to said external electrode consists of a
material having an emissivity higher than the emissivity of
said external electrode.

Sub F2
15. An oxygen concentration detector according to claim 12, wherein said material having a high emissivity has an emissivity of 0.3 or more.

Sub A6
16. An oxygen concentration detector comprising:
a sensor element including a solid electrolyte and external and internal electrodes provided on external and internal surfaces thereof, respectively;
a heater provided adjacent to an internal surface of said sensor element;
wherein at least said surface of said internal electrode consists of a material having a high emissivity, and a layer consisting of a material having an emissivity lower than the emissivity of said internal electrode is provided as an outermost layer of said sensor element.

Sub F3
17. An oxygen concentration detector according to claim 16, wherein said material having a high emissivity has an emissivity of 0.3 or more.

add A7
add F4